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Guarding The Gate: Some Problems In Expert Evidence In Scots Law

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Abstract

Until recently Scots law had not explicitly developed a test on the reliability of expert evidence as a precondition for its admissibility. The court of appeal in *HM Advocate v Young* (2014), building upon earlier decisions in *Liehne* (2011) and *Hainey* (2013), has now set out criteria for determining whether expert evidence is based on a science or other organised discipline in order for the evidence to be admissible. This paper considers the approach of Scots law before and after *Young* and provides a critical examination of the court's approach in that case. It argues that the judgment fails to deal with many relevant issues, such as those canvassed in the US Supreme Court in *Daubert v Merrell Dow Pharmaceuticals Inc* (1983) and by the Law Commission for England and Wales in its recent report on expert evidence.

Keywords

Law, criminal evidence, expert evidence, reliability, Scots law.

GUARDING THE GATE: SOME PROBLEMS IN EXPERT EVIDENCE IN SCOTS LAW

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The evidence of expert witnesses has for long been treated with a degree of caution, if not scepticism. The reason is not hard to find. Generally witnesses give evidence on what they have seen, observed, and so on but cannot give an interpretative opinion on what that evidence means. But there is an exception in case of expert witnesses who can make reflective inferences from factual evidence. This type of opinion evidence is bound to carry great significance for the jury or judge acting as a fact-finder, especially as expert evidence is competent only on matters beyond ordinary knowledge. So the question arises as to how expert evidence is to be policed or controlled.

To date, Scots law has developed two main responses. The first is the rule that an expert cannot give opinion on the 'ultimate issue' before the court; the second is the rule that expert evidence must not usurp the role of the fact-finder.

The first rule offers little in placing limits on the role of expert testimony. In *Hendry v HM Advocate*,¹ on a trial for murder the deceased, who had a heart condition, had died of a heart attack shortly after being assaulted by the accused. The appeal court strongly disapproved of questions asked to an expert medical witness whether he could say beyond reasonable doubt that the assault rather than some other factor was the cause of death. However, this protection against the scope of expert evidence is easily avoided simply by using phrases other than 'beyond reasonable doubt' in questions. Indeed in *Hendry* the court accepted that medical experts could be asked how confident they were of the opinions they had expressed on the cause of death. Furthermore, in practice this rule is often ignored without any objection. For example, in *Williamson v HM Advocate*² several expert witnesses expressed opinions on whether the accused's medical condition amounted to diminished responsibility.³

A stronger protection seems to lie in the second rule, about the demarcation of the respective roles of expert witness and fact-finder. This was set out in the classic and much-quoted dicta of Lord President Cooper in *Davie v Magistrates of Edinburgh*:⁴

"Expert witnesses, however skilled or eminent, can give no more than evidence. They cannot usurp the functions of the jury or Judge sitting as a jury. ... Their duty is to furnish the Judge or jury with the necessary scientific criteria for testing the accuracy of their conclusions, so as to enable the Judge or jury to form their own independent judgment by the application of these criteria to the facts proved in evidence.

¹ 1987 JC 63

² 1994 JC 149

³ It also seems that the ultimate issue rule no longer applies in English law (*R v Stockwell* (1993) 97 Cr App R 260; Archbold, *Criminal Pleading Evidence and Practice* (2014 edn), para 10-51).

⁴ 1953 SC 34, 40.

The scientific opinion evidence, if intelligible, convincing and tested, becomes a factor (and often an important factor) for consideration along with the whole other evidence in the case, but the decision is for the Judge or jury."

These dicta still dominate discussion of expert evidence in Scots law but they have unwittingly led to problems in respect of one important aspect of the use of expert evidence.

Admissibility of expert evidence

In general terms, there are three main issues concerning the role and admissibility of expert evidence:⁵

- (i) whether the evidence is necessary;
- (ii) whether the proposed witness is qualified to give opinion/expert evidence; and
- (iii) whether expert evidence is 'reliable', that is whether it is based on an organised discipline or science.

These issues overlap but although Scots law has so far developed some guidance of the first two, it has only recently started to deal with the third.

(i) Necessity

The question on this point is whether the trier of fact requires expert evidence at all or whether the subject matter of the evidence is something which is or deemed to be within everyday knowledge. For these purposes knowledge of facts can be divided into three types.

First, some facts are so well known that they fall within judicial knowledge (sometimes irreverently described as facts so obvious that even judges know of them). But the rules on judicial knowledge are themselves far from clear on determining what lies within its scope. Indeed in the influential decision of the US Supreme Court of *Daubert v Merrell Dow Pharmaceuticals Inc.*,⁶ the majority justices suggested that certain scientific theories were so well known as to fall within judicial knowledge, and gave the example of the laws of thermodynamics.⁷

The crucial point is that where any fact is within judicial knowledge, any evidence (whether expert or not) to prove that fact is not only unnecessary but probably also incompetent, even where the trier of fact is a jury. *Petto v HM Advocate*⁸ involved a charge of murder where a fire was started in one flat in a Glasgow tenement which led to the death of a person living in another flat. The appeal court held that there was no need for evidence to show that a typical tenement was densely populated with flats on several floors of the building, as all this was within judicial knowledge.

For expert evidence the crucial distinction is between two other types of knowledge namely those of (a) facts which embody everyday knowledge (which are within the domain of a trier of fact) and (b) facts which are beyond everyday knowledge and for which expert evidence

⁵ For a judicial statement of these issues see *R v Bonython* (1984) 38 SASR 45, 46-47 (Supreme Court of South Australia). A similar formulation was made by the Supreme Court of Canada in *R v Mohan* [1994] 2 SCR 9, where it was also pointed out that expert evidence is inadmissible if it triggers an exclusionary rule of evidence.

⁶ 509 US 579, 592, footnote 11 (1983)

⁷ This may come as a surprise to many judges in Scotland, all the more so as CP Snow once used the general ignorance by non-scientists of the second law of thermodynamics as an example of the pitfalls in the development of two different cultures (scientific and literary): CP Snow, *The Two Cultures* (Cambridge UP, 1998 edn), pp 14-15.

⁸ 2012 JC 105

may be required. Drawing this distinction is not always straightforward in practice. For example, assessing the reliability and credibility of a witness is said to be a matter for the jury unless the witness suffered from some sort of mental disorder, in which case an expert can give evidence on the effect which that disorder may have on witness's testimony.⁹ But this general rule is subject to various exceptions and in any case ignores a whole range of studies which suggest that in many circumstances even 'normal' witnesses are prone to error in what they perceived or can later recall.¹⁰ Sir Gerald Gordon commented on the *Grimmond* case that the key distinction in this context should be between matters which are, and those which are not, the subject of bodies of expert knowledge,¹¹ but as *Gage* shows that is not how the law has developed.

(ii) *Qualifications of an expert*

Assuming that expert evidence is required the next issue is whether the proposed witness is qualified as an expert. Scots law has developed some criteria for the steps to be taken in establishing whether a person has expertise in some area¹², which is essentially a matter of satisfying the court that he or she has sufficient knowledge and experience. In *Wilson v HM Advocate*,¹³ police officers were allowed to give evidence on the form of cannabis typically used in importing that drug. The officers had obtained this information from attending seminars and having discussions with customs officers. The appeal court rejected a submission that the evidence was hearsay and instead held that it embodied the received wisdom of persons concerned in the enforcement of drugs law.

There are also cases on a separate problem, that a witness might be an expert in one discipline but not in other, though related areas. This problem of the expert who strays beyond his field of expertise was famously illustrated in the case of *R v Sally Clark*,¹⁴ where a mother was accused of murdering on separate occasions her two young sons, whom she claimed had died of infant death syndrome. At the trial expert evidence was given for the Crown by a very distinguished paediatrician who been part of a multi-disciplinary research project on sudden deaths in infancy. The witness gave evidence based on that project that the chance of there being two separate cot deaths occurring in the family circumstances of the accused was 1 in 73 million. However, the witness was an expert in paediatrics but not in statistics and the Court of Appeal expressed concern that this evidence had been admitted at all, as being beyond the witness's area of expertise.¹⁵

In practice, establishing the expert status of a witness is made at the trial, rather than pre-trial, at the start of the witness's examination. Whether a witness is an expert is a question for the judge to decide, it is not an issue for the jury. There is no clear authority for the view, which seems correct in principle, that a judge can raise the question of a witness's expertise *ex proprio motu*.

⁹ *HM Advocate v Grimmond* 2002 SLT 508.

¹⁰ *Gage v HM Advocate* 2012 SCCR 161, discussed by Andrew Roberts "Expert evidence on the reliability of eyewitness identification – some observations on the justifications for exclusion: *Gage v HM Advocate*" (2012) 16 E & P 93.

¹¹ 2001 SCCR 708, 714.

¹² F Raitt, *Evidence: Principles, Policy and Practice* (2nd edn, 2013), pp 48-50.

¹³ 1988 SCCR 384

¹⁴ [2003] EWCA 1020

¹⁵ The Court also noted even within the realm of statistics the evidence was inaccurate.

(iii) *Accuracy of the science*

But even if it can be established that a witness is an 'expert' a further question arises whether the expertise relates to a body of knowledge which is properly structured in method and has been tested so as to amount to a science (or other discipline) that can provide reliable evidence in legal proceedings. This topic has been very controversial in many legal systems but until recently there has been very little discussion of the issues involved in Scots law.

Older cases suggest that the Scottish courts took the view that a branch of knowledge is a reliable science for legal proceedings where it is generally accepted as an accurate science by its practitioners. In *Hamilton v HM Advocate*,¹⁶ the only evidence as to the identity of the perpetrator of theft from a shop was fingerprint evidence from two Scotland Yard officers who testified that there was a complete match between 16 points in fingerprints on a bottle on the premises and prints taken from the accused. The appeal court was impressed by statements made by these experts that this method of identification had been widely followed in several jurisdictions for many years and that there never has been any case of identical matches of prints from two different people. Indeed the court modified the experts view that this method was an infallible means of identification by saying that what was meant was a type of practical rather than absolute infallibility, and that the reliability of the evidence may be accepted "not because it is irrebuttable in its own nature, but because long and extensive experience is shown to prove no instance in which it has ever been successfully rebutted."¹⁷

*Welsh v HM Advocate*¹⁸ was the first case in which the appeal court considered the technique of DNA profiling but it did not discuss the nature or reliability of the science involved in it. Instead it simply noted that the statistical probability which the technique suggested in each case was a matter for the jury to consider in determining whether the overall evidence was sufficient to warrant conviction.¹⁹

In *Campbell, Steele & Clark v HM Advocate*,²⁰ the accused had been convicted of murder. Part of the case against them consisted of statements they were said to have made to various police officers whose evidence in court was in virtually identical terms. The officers asserted that they had recorded the statements when they were made or shortly afterwards, and denied they had compared notes. The appeal court heard expert evidence that it was unlikely that the officers could have recalled the statements in almost identical terms. At the appeal hearing the Crown had criticised the methodology used by the experts. The court held that had the jury heard this evidence they might not have convicted the accused and the convictions were quashed. However the decision on the admissibility of the expert evidence was made at a preliminary hearing of the appeal and no reasons were given for the court's decision.²¹

*HM Advocate v A*²² involved a charge of lewd and libidinous behaviour against two complainers which was said to have occurred 20 years earlier. The defence were allowed to lead evidence that one of the complainers suffered from false memory syndrome. The

¹⁶ 1934 JC 1

¹⁷ At pages 3-4. The infallibility of the 16-point match however did not survive the saga of *HM Advocate v Shirley McKie* (see Raitt, op cit, pp 64-65).

¹⁸ 1992 SLT 193

¹⁹ 1992 SCCR 108, 118

²⁰ 2004 SCCR 220

²¹ 2004 SCCR 220, 249, commentary of Sir GH Gordon.

²² 2005 SCCR 593

defence objected to the admissibility of evidence by an expert witness for the Crown to the effect that there was no phenomenon as false memory syndrome as contrasted with the idea of repression of memory. After a trial within the trial the judge held that the Crown evidence to be admissible on the basis that the issue was something beyond the experience and knowledge of the jury, and cited in support dicta from an Australian case that²³

"[B]efore opinion evidence may be given upon the characteristics, responses or behaviour of any special category of persons, it must be shown that they form a subject of special study or knowledge and only the opinions of one qualified by special training or experience may be received."

However the judge did not expressly examine whether either false memory syndrome or the conditions of repression of memory were based on a subject of special study or knowledge.

In *HM Advocate v McGinty*,²⁴ an accused was charged with being concerned in the supply of the controlled drug, cannabis resin. Part of the Crown case was from two forensic scientists that banknotes found at the accused's house had tested positive for the presence of cannabis and that this showed that someone had handled the drug before touching the notes. After conviction an expert report pointed to various flaws in the methodology underlying that conclusion, part of which was that it had not taken account of other research on the different ways in which drug traces could be present on bank notes. The appeal court held that there had been a miscarriage of justice.²⁵

All of these cases were consistent with the traditional, though largely implicit, approach of Scots law that admissibility of expert evidence depended upon it being based on generally accepted methodology but that there was no special role for the court to be satisfied that the methodology was sound. In other words, there was no separate inquiry into the reliability of expert evidence.

However 3 more recent cases have indicated the start of a change to this approach.

The first of these cases, *Liehne v HM Advocate*,²⁶ was more concerned with the question how a judge should direct the jury where complex expert evidence had been given at a trial. The case concerned a charge of the culpable homicide of a baby. On the key issues of the possible cause of death, both the Crown and the defence led expert evidence which was detailed and conflicting. In charging the jury the trial judge followed the usual practice of not rehearsing this evidence in any detail. Furthermore, seemingly mindful of the overriding principle that the assessment of expert evidence was for the jury, the judge did not give any directions on how the jury should approach the evidence in this case.

On appeal against conviction the appeal court held the trial judge had inadequately directed the jury. The court noted that the evidence for the defence was all consistent with a natural

²³ *Transport Publishing Co Pty Ltd v The Literature Board of Review* (1956) 99 CLR 111, 119.

²⁴ [2006] HCJAC 8

²⁵ For discussion see A Marks, "Expert evidence of drug traces: relevance, reliability and the right to silence" [2013] Crim Law Rev 810. In a later case on drug traces, *Smith v HM Advocate* 2008 SCCR 255, *McGinty* was not referred to. The decision in *Smith* was based on a point other than admissibility of expert evidence.

²⁶ 2011 SCCR 419 (reported as *Walker v HM Advocate* 2011 SLT 1114).

explanation for the death but differed in how the death might have occurred. In these circumstances the jury required directions which focused on these explanations to allow it to consider this evidence in a logical manner. These directions would identify and succinctly review the various explanations. Leaving such technical evidence at large for the jury amounted to a misdirection.

A similar point was made in respect of the Crown evidence, all of which suggested that the death had occurred as a result of the accused having suffocated the child, but this evidence was wide-ranging in its scope and derived from various disciplines, and as a consequence the trial judge should have provided some structure for the jury's deliberations.

It should be noted that at this stage there was no suggestion that the trial judge should in any way attempt to assess the worth or strength of the expert evidence, which remained the task of the jury. However the two cases which followed *Liehne* introduced a new role for a trial judge in respect of expert evidence.

*Hainey v HM Advocate*²⁷ was also concerned with the death of a young child whose mother was accused of murder by neglecting her and failing to provide food and medical care. By the time the child's dead body was discovered it was heavily decomposed. The Crown called as expert witnesses two forensic anthropologists who were asked questions about the likely age of the child at death. But they were also asked questions about the state of the child's health at that date and in response mentioned two medical factors (cortical erosions and Harris lines) which indicated neglect. The witnesses had no qualifications in medicine. In his speech the advocate depute stated that the Crown was not relying on the evidence in respect of cortical erosions.

As for the other factor (Harris lines) one of the expert witnesses claimed to have some expertise despite the lack of any medical qualification but did accept that she has failed in her written report to refer to papers criticising the use of this factor.

In his charge to the jury the trial did not rehearse the expert evidence in any detail. Furthermore, the judge directed the jury to scrutinise with care the evidence in regard to both of the medical conditions.

On appeal the court held that the judge had not followed the requirements set out in the *Liehne* decision.²⁸ But the main criticism by the appeal court was the judge's failure to deal with the status of the witnesses as experts. The court pointed out that it was a duty of a trial judge to satisfy himself that someone proffered as an expert witness had the appropriate competence and expertise on the matter on which he or she is invited to give opinion evidence. This was not an issue to be left for the jury to decide. Indeed where, as here, evidence is given by a witness who is not qualified as an expert on that subject the judge should direct the jury to disregard that evidence.

²⁷ 2013 SLT 525

²⁸ More recently the appeal court has repeatedly emphasised that a trial judge never has to rehearse or summarise evidence in a charge to the jury and that giving the jury guidance on how to approach expert evidence is required only where there is conflicting evidence of a complex technical nature (*D'Arcy v HM Advocate* [2013] HCJAC 173; *Deeny v HM Advocate* [2014] HCJAC 104; *Younas v HM Advocate* [2014] HCJAC 114); *Ramzan v HM Advocate* [2015] HCJAC 9).

The appeal court accepted that there was no procedure or hearing prior to a trial for a judge to act as a gatekeeper to determine the status of a witness as an expert task but the judge was under a duty to perform this task if the issue arose during the trial. As the appeal court pointed out:

"Putting matters colloquially it cannot be right for a trial judge to allow an obvious 'quack' doctor to speak to a subject in a supposed expert way in relation to which he has no qualifications, and to allow his evidence to be placed before a jury with the simple direction that it is a matter for them to assess his competence."

The court also stated that consideration should be given to following English law by providing a pre-trial hearing to determine issues relating to medical evidence. Indeed the court went further by referring to guidance set out in an English case,²⁹ which could usefully be followed in Scotland and added:

"It was also suggested that where it is relevant to do so, *the jury* should be reminded that today's scientific orthodoxy may become tomorrow's outdated learning and in cases where developing medical science is relevant they should be instructed that special caution is needed where expert opinion evidence is fundamental to the prosecution.

Where relevant, *the jury* should be asked to consider whether the expert has, in the course of his evidence, assumed the role of an advocate, whether he has stepped outside his area of expertise, whether he was able to point to a recognised peer-reviewed source for his opinion, and whether his clinical experience is up to date and equal to that of others whose opinions he seeks to contradict." (Italics added.)

This passage does not sit easily with other dicta in this case for it seems to suggest that the decision on whether a witness is first of all an expert and secondly in relation to a recognised science is for the jury and not the trial judge to make.

In *Hainey* the appeal court was dealing with two issues, namely the use of the *Liehne* requirements in directing a jury and the need to establish a witness's qualifications and experience in matters on which he or she is to give expert evidence. But by referring to the gatekeeper role, as used in English law, the court went one step further by bringing in the issue of the reliability of the evidence.

Qualification as an expert and the soundness of the body of knowledge of the supposed expertise are two separate though related issues. This is perhaps obscured by the court's unfortunate mention of a quack. A quack could refer to a person who lacks any qualifications or experience in a recognised discipline but it could also refer to a body of knowledge which lacks any sound scientific foundation. Someone could well be an expert in a quack science.

What is involved in the issue of the reliability of expert evidence was considered in *Young v HM Advocate*.³⁰ In that case an accused had some years earlier been convicted of murder. He wished to raise an appeal based on the use of a technique called case-linkage analysis, which he argued indicated the possibility that over a period of time someone other than the accused

²⁹ *R v Henderson (Practice Note)* [2010] EWCA Crim 6

³⁰ 2014 SLT 21 (for the sequel see [2014] HCJAC 113).

had been responsible for the killings of a number of victims, including the person the accused had been convicted of murdering. The appeal court held a hearing to determine whether expert evidence on case-linkage analysis was admissible for purposes of deciding the appeal. The appeal court heard evidence on this technique from two witnesses, one of whom spoke to the strengths and the other to the weaknesses of this technique. In the event the court held that case-linkage analysis was not sufficiently developed for it to possess the necessary qualities to be the subject of expert evidence in court proceedings.

The criteria which the court in *Young* set out for expert evidence to be based on a reliable science or technique and hence admissible are that it must:³¹

- be based on a recognised and developed academic discipline;
- proceed on theories which have been tested (both by academic review and in practice);
- be found to have a practical and measurable consequence in real life;
- follow a developed methodology which is explicable and open to possible challenge; and
- produce a result which is capable of being assessed and given more or less weight in light of all the evidence before the finder of fact.

It is clear that the question of reliability is one for the judge to determine not a jury but in *Young* the court gave no indication of the procedure to be used in dealing with this issue.

Reliability of expert evidence in Scots law: as assessment

To assess the *Young* criteria it is necessary to examine the source or the sources which the court used. However none is cited in the judgment.

Nonetheless, the court did mention a decision of the US Supreme Court is *Daubert v Merrell Dow Pharmaceuticals Inc*,³² though there is no discussion of the substance of the judgments in that case and reference to it is made only in considering the submissions of the parties. This may be the first occasion when a Scottish court has referred to *Daubert* and it is surprising that the court in *Young* did not discuss it in any detail. *Daubert* is probably the most famous, or infamous, decision on the reliability of expert evidence,³³ and has influenced the law in jurisdictions beyond the USA (eg Canada).³⁴

Certainly the criteria adopted by the court in *Young* bear a strong resemblance to those in *Daubert*. The majority judgment stated that there are many factors relevant to the inquiry on the scientific status of a body of knowledge and mentioned the following:³⁵

³¹ Para 54. It is clear that the question of reliability is one for the judge to determine not a jury but in *Young* the court gave no indication of the procedure to be used in dealing with this issue.

³² 509 US 579 (1993). The tests set out in this case were refined in *General Electric Co v Joiner* 522 US 136 (1997) and *Kumho Tire Co v Carmichael* 526 US 137 (1997). The three cases are often referred to as the *Daubert* trilogy.

³³ There is a huge, mainly critical, literature on *Daubert*. For a good overview see M Redmayne, *Expert Evidence and Criminal Justice* (2001, OUP), ch 5. For criticism of the Court's views on what counts as science, see eg Susan Haack, *Evidence Matters. Science, Proof and Truth in the Law*, (Cambridge UP, 2014), chs 5-7.

³⁴ *R v J-LJ* [2000] 2 SCR 600.

³⁵ 509 US 579, 592-595 (1993). The Court stressed that this was not a definitive checklist and that the inquiry was a flexible one.

- whether the theory or technique in question can be (and has been) tested,
- whether it has been subjected to peer review and publication,
- its known or potential error rate and the existence and maintenance of standards controlling its operation, and
- whether it has attracted widespread acceptance within a relevant scientific community.

An alternative source for the *Young* criteria was a recent report by the Law Commission for England and Wales on expert evidence in criminal trials.³⁶ That Report recommended the use of a detailed and structured set of factors that a court should use in determining whether expert evidence is sufficiently to be admitted in court proceedings. These factors are not identical to but are broadly consistent with those in *Daubert* and *Young*.

The Commission's report was not explicitly referred to by the court in *Young* but it is reasonable to assume that the court was aware of it.

However, the court in *Young* did not identify the source (or sources) for the criteria it adopted on the reliability of expert evidence, which are instead presented as self-standing. This gives rise to three related problems. One is what do the criteria mean? Each criterion uses terms which are either vague or contestable (eg 'recognised academic discipline'; 'tested theories'; 'explicable methodology'; 'measurable real-life consequences').

Secondly, as with any one single decision *Young* leaves many questions unanswered. For example, do the criteria form of hard and fast rules or are they guidelines? Are they exhaustive?³⁷

Further and as yet unanswered questions include whether the *Young* criteria apply equally to 'hard' natural sciences as to social and behavioural sciences or to disciplines which are not scientific (such as statistics)?³⁸ What procedures (such as pre-trial diets; advance notice of objections to reliability) are to be used in determining these issues? In criminal cases do the criteria apply in the same way to expert evidence for the Crown and for the accused? What judicial training is required for courts to be able to decide questions of reliability?³⁹

A third difficulty is that the criteria are not located within the wider context and debate about what is involved in determining the accuracy of a science or a body of knowledge. A key issue here is the distinction between science (or a branch of science) and the philosophy of science. Whether something like case-linkage analysis (or evolution or creationism) is a

³⁶ Law Commission *Report on Expert evidence in criminal proceedings in England and Wales* (Law Com No 325) (2011)

³⁷ Another issue is whether the criteria apply to civil as well to criminal cases. In *Kennedy v Cordia (Services) LLP*, the Inner House held that they do [2014] CSIH 76, para 16. This decision illustrates a further point which is that the issue before the court, whether an employer was under a particular duty of care to an employee, was a question of law for the judge to decide and could not therefore be the subject of expert evidence. The *Young* criteria have been applied in a summary criminal trial: *PF Alloa v C* (Sheriffdom of Tayside Central and Fife at Alloa, 1 December 2014).

³⁸ In *McMahon v Dear* [2014] CSOH 100 expert evidence was admitted on the practice of shouting 'Fore!' when playing golf.

³⁹ As a consequence of *Daubert* various publications have appeared in the United States to assist judges in understanding scientific disciplines. The current edition of *Reference Manual on Scientific Evidence* (3rd edition, 2011; compiled by the US Federal Judicial Center and the National Research Council of the US National Academies) runs to over 1000 pages.

science cannot be answered within that body of knowledge but requires consideration of a different level of inquiry as to what constitutes or is to count as 'science' or 'a science'.⁴⁰ This distinction is sometimes not noted when, as in *Young* itself, evidence on what case-linkage analysis predicts or explains is given by the same witnesses on the separate question whether case-linkage analysis is a science. And problems become deeper once it is realised that there is no consensus within philosophy of science as to what science or correct scientific method is.

In *Daubert* the majority of the US Supreme Court attempted to deal with these issues by expressly setting out what for them constitutes science by noting and approving the approach associated with Karl Popper on falsifiability as the true basis of scientific method.⁴¹ The difficulty with this approach is that Popper's theory is neither straightforward nor is it widely accepted as a sound basis for describing the nature of scientific inquiry. Furthermore, the majority justices compounded this problem by saying that their preferred approach was also to be found in the writings of Carl G Hempel on testability without realising that Hempel's views differ from Popper's in some fundamental respects.⁴² Nonetheless, these theories provide some basis for understanding and assessing the *Daubert* tests. By contrast the court in *Young* did not set out the background theory which shows how the criteria it provided properly identify a body of knowledge as a form of science.

Scots law: the way forward

Finally how should Scots law on the reliability of expert evidence develop? The most obvious and suitable way is for the Scottish Law Commission to consider the subject. As the issues involved with reliability are very wide-ranging and draw upon disciplines beyond law, the types of consultation used by the Commission would be an appropriate method of achieving systematic law reform. However, unless the topic is referred to the Commission by the Scottish Government, it is unlikely that this will be the route taken. Reliability of expert evidence was suggested to the Commission in its consultation on its Ninth programme of law reform but in the event was not included in its recently published programme.⁴³

Another possibility is that the topic is considered by a senior judge on the model of the reviews by Lords Carloway and Bonyon, but it is not clear how this approach has any advantages over that of the Scottish Law Commission.

Another way is to allow the courts to develop the law. However, this approach can provide only occasional and piecemeal answers and requires full citation of the extensive case-law and literature on reliability are very wide-ranging and draw upon disciplines beyond the law.

⁴⁰ This point is missed in Rehnquist CJ's dissent in *Daubert* when he doubted whether judges in performing a gatekeeper responsibility had the "obligation or the authority to become amateur scientists in order to perform that a role" (509 US 579, 600-601(1993)). Rather what they need to become were amateur philosophers of science.

⁴¹ 509 US 579, 593 (1993). This drew from Rehnquist, CJ the comment (509 US 579, 600 (1993)): "I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its 'falsifiability' and I suspect some of them will be, too."

⁴² Haack, *op cit*, pp 106-110.

⁴³ Scottish Law Commission, *Ninth Programme of Law Reform* (Scot Law Com No 242 (2015)).

Finally, it is worth noting what happened to the recommendations made by the Law Commission for England and Wales in their recent report on the topic.⁴⁴ The UK Government indicated that it did not favour implementing these recommendations in statute (mainly on the basis of cost) but did suggest that at least part of the proposed reforms should be considered by the Criminal Procedure Rule Committee with a view to amending the Criminal Procedure Rules.⁴⁵

These changes have now been made but the new rules go much further than the Government had anticipated.⁴⁶ The amended rules themselves introduce a number of procedural requirements for cases involving expert evidence but they are accompanied by a Practice Direction⁴⁷ which embodies a reliability test which is very much like the test formulated by the Law Commission. The justification provided by the Rule Committee for setting out a substantive test in a practice direction was that the courts were already developing such a test at common law.

The effect is that English law now has detailed provisions on both the procedure and substance of reliability as a criterion for the admissibility of expert evidence. Scots law should seek to have the same.

⁴⁴ Law Commission *Report on Expert evidence in criminal proceedings in England and Wales* (Law Com No 325) (2011).

⁴⁵ The Government's response to the Law Commission report: "*Expert evidence in criminal proceedings in England and Wales*" (Law Com No 325), (21 November 2013), paras 3-5).

⁴⁶ Criminal Procedure Rules 2014, Part 33. For discussion see Ian Dennis, "Tightening the law on expert evidence" [2015] *Crim Law Rev* 1-2. For judicial comment, *R v H* [2014] EWCA Crim 1555 at [44].

⁴⁷ [2014] 1 WLR 3001